land in controversy, has shifted north so that its present southern extremity is more than a mile and a half north of its northern line in the year 1839.

In suport of our contention that the true boundary line is the varying center or middle of that channel of the river which is best suited and ordinarily used for the purposes of navigation, we beg leave to draw attention to some of the decisions of this court, which appear to conclusively sustain our position:

The State of Nebraska filed its original bill against the State of Iowa in order to have the boundary line between the two states determined. Iowa was admitted into the Union in 1846 and its western boundary, as defined by the act of admission, was the middle of the main channel of the Missouri river. Nebraska was admitted in 1867, and its eastern boundary was likewise the middle of the channel of the Missouri river. Between 1851 and 1877 there were marked changes in the course of this channel so that in the latter year it occupied a very different bed from that through which it flowed in the former year. It was observed by Mr. Justice Brewer, in the course of his very able opinion, that: (page 360)

It is settled law, that when grants of land border on running water, and the banks are changed by that gradual process known as accretion, the riparian owner's boundary line still remains the stream, although, during the years, by this accretion, the actual area of his possessions may vary. In *New Orleans v. United States*, 10 Pet. 662, 717, this court said: "The question is well settled at common law, that the person whose land is bounded by a stream of water which changes its course gradually by alluvial formation, shall still hold by the same boundary, including the accumulated soil. No other rule can be applied on just principles. Every proprietor whose land is thus bounded is subject to loss by the same means which may add to his territory; and, as he is without remedy for his loss in this way, he cannot be held accountable for his gain." (See, also, *Jones v. Soulard*, 24 How. 41; *Banks v. Ogden*, 2 Wall. 57; *Saulet v. Shepherd*, 4 Wall. 502; *St. Clair v. Lovingston*, 23 Wall. 46; *Jeffries v. East Omaha Land Co.*, 134 U. S. 178.)

It is equally well settled, that where a stream, which is a boundary, from any cause suddenly abandons its old and seeks a new bed, such change of channel works no change of boundary; and that the boundary remains as it was, in the center of the old channel, although no water may be flowing therein. This sudden and rapid change of channel is termed in the law "avulsion." In Gould, Waters Sec. 159 it is said: "But if the change is violent and visible, and arises from a

known cause, such as a freshet, or a cut through which a new channel is formed, the original thread of the stream continues to mark the limits of the two estates." 2 Bl. Com, 262; *Angell on Water Courses*, channel is termed, in the law, avulsion. In *Gould on Waters*, §159, it §60; *Trustees v. Dickinson*, 9 Cush. 544; *Buttenuth v. St. Louis Bridge Co.*, 123 Illinois 535; *Hagan v. Campbell*, 8 Porter (Ala.) 9; *Murray v. Sermon*, 1 Hawks (N. C.) 56.

These propositions, which are universally recognized as correct where the boundaries of private property touch on streams, are in like manner recognized where the boundaries between states or nations are, by prescription or treaty, found in running water. Accretion, no matter to which side it adds ground, leaves the boundary still the center of the channel. Avulsion has no effect on boundary, but leaves it in the center of the old channel. In volume 8, Opinions of Attorney General, 175, 177, this matter received exhaustive consideration. A dispute arose between our government and Mexico in consequence of changes in the Rio Bravo. The matter having been referred to Attorney General Cushing, he replied at length. We quote largely from that opinion. After stating the case, he proceeds:

"With such conditions, whatever changes happen to either bank of the river by accretion on the one or degradation of the other, that is by the gradual, and, as it were, insensible, accession or abstraction of mere particles, the river as it runs continues to be the boundary. One country may, in process of time, lose a little of its territory, and the other gain a little, but the territorial relations cannot be reversed by such imperceptible mutations in the course of the river. The general aspect of things remains unchanged. And the convenience of allowing the river to retain its previous function, notwithstanding such insensible changes in its cource, or in either of its banks, outweighs the inconveniences, even to the injured party, involved in a detriment, which, happening gradually, is inappreciable in the successive moments of its progression.

"But, on the other hand, if, deserting its original bed, the river forces for itself a new channel in another direction, then the nation, through whose territory the river thus breaks its way, suffers injury by the loss of territory greater than the benefit of retaining the natural river boundary, and that boundary remains in the middle of the deserted river bed. For, in truth, just as a stone pillar constitutes a boundary, not because it is a stone, but because of the place in which it stands, so a river is made the limit of nations, not because it is running water bearing a certain geographical name, but because it is water flowing in a given channel, and within given banks, which are the real international boundary.

Such is the received rule of the law of nations on this point, as laid down by all the writers of authority."

After a review of a great many cases upon the question, the court held that the result of these authorities puts it beyond doubt

that accretion on an ordinary river would leave the boundary line between two states the varying center of the channel, and that avulsion would establish a fixed boundary, to-wit: the center of the abandoned channel.

It was contended in that case that the doctrine of accretion had no application to the Missouri river on account of the rapid and great changes constantly going on in respect to its banks, but the court held the contrary, and the conclusion was reached that notwithstanding the rapidity of the changes in the course of the channel and the washing from the one side and on to the other, the laws of accretion control on the Missouri river as elsewhere, not only in respect to the rights of individual land owners, but likewise to the boundary lines between states; and the court decided that the boundary line between the states was a varying line so far as affected by these changes of diminution and accretion and the mere washing of the waters of the stream.

Nebraska v. Iowa, 143 U. S. 359.

The next case from which we desire to quote is that of *Iowa v. Illinois*, 147 U. S. 1. Iowa contended that the boundary line between the states was the middle of the main body of the river taking the middle line between its banks or shores without regard to the "steamboat channel," as it was termed, or deepest part of the stream, and that to determine the banks or shores, measurements must be taken when the water is in its natural or ordinary stage, neither swollen by floods nor shrunk by drouths. Illinois claimed that its jurisdiction extended to the middle of the "steamboat channel" of the river wherever that might be—that channel in which commerce upon the river by steamboats or other vessels is usually conducted and which for that reason is sometimes designated as "the channel of commerce." In the course of the opinion it was observed: (P. 7.)

When a navigable river constitutes the boundary between two independent states, the line defining the point at which the jurisdiction of the two separates is well established to be the middle of the main channel of the stream. The interest of each state in the navigation of the river admits of no other line. The preservation by each of its equal right in the navigation of the stream is the subject of

paramount interest. It is therefore laid down in all the recognized treatises on international law of modern times that the middle of the channel of the stream marks the true boundary between the adjoining states up to which each state will on its side exercise jurisdiction.

The court approvingly quoted as follows from Mr. Creasy in his First Platform on International Law:

It has been stated that, where a navigable river separates neighboring states, the thalweg or middle of the navigable channel, forms the line of separation. Formerly a line drawn along the middle of the water, the *medium filum aquae*, was regarded as the boundary line; and still will be regarded *prima facie* as the boundary line, except as to those parts of the river as to which it can be proved that the vessels which navigate those parts keep their course habitually along some channel different from the *medium filum*. When this is the case, the middle of the channel of traffic is now considered to be the line of demarcation.

The court likewise quoted from Halleck's Treatise on International Law:

Where the river not only separates the conterminous states, but also their territorial jurisdictions, the thalweg, or middle channel, forms the line of separation through the bays and estuaries through which the waters of the river flow into the sea. As a general rule, this line runs through the middle of the deepest channel, although it may divide the river and its estuaries into two very unequal parts. But the deeper channel may be less suited or totally unfit for the purposes of navigation, in which case the dividing line would be in the middle of the one which is best suited and ordinarily used for that object.

After reviewing many other authorities, the court concluded its opinion in the following language: (P. 13.)

But we are of opinion that the controlling consideration in this matter is that which preserves to each state equality in the right of navigation in the river. We therefore hold, in accordance with this view, that the true line in navigable rivers between the states of the Union which separates the jurisdiction of one from the other is the middle of the main channel of the river. Thus the jurisdiction of each state extends to the thread of the stream, that is, to the "mid-channel," and, if there be several channels, to the middle of the principal one, or rather, the one usually followed.

It is therefore ordered, adjudged, and declared that the boundary line between the State of Iowa and the State of Illinois is the middle of the main navigable channel of the Mississippi river.

The same doctrine was announced and followed in the case of *Msisouri v. Nebraska*, 196 U. S. 23. It was not disputed in that case that prior to July 5, 1867, the bed and channel of the Missouri river were substantially as they had been continuously since the admission of the respective states into the Union, only such variation occurring during that entire period as naturally followed in the course of time from one side of the river to the other; but on July 5, 1867, which was subsequent to the admission of Nebraska into the Union, within twenty-four hours and during a time of very high waters, the river which had for years passed around what is called McKissick's Island, cut a new channel across and through a narrow neck of land at the west end of the island precinct (of which McKissick's Island formed a part) about one-half mile in width, making for itself a new channel and going through what was at this time the territory of Nebraska. After that change the river ceased to run around McKissick's Island. The whole channel dried up and became tillable land and the bed of the river was vacated for about fifteen miles in length. This change in the bed or channel of the river became fixed and permanent. The question presented in this case was whether the sudden and permanent change in the course or channel of the river worked a change in the boundary line between the two states. The court held that the facts would not admit of the case coming within the law of accretion but that of avulsion. By the selection of a new channel, the boundary was not changed and it remained as it was prior to the avulsion, the center line of the old channel.

In the case of *Louisiana v. Mississippi*, 202 U. S. 1, the court reaffirmed the principles enunciated in the preceding cases and referred to many other authorities to the same point. We quote the following from that opinion: (p. 49.)

The term "thalweg" is commonly used by writers on international law in definition of water boundaries between states, meaning the middle or deepest or most navigable channel. And while often styled "fairway" or "midway" or "main channel," the word itself has been taken over into various languages. Thus in the treaty of Luneville, February 9, 1807, we find "le Thalweg de l'Adige," "le Thalweg du Rhin," and it is similarly used in English treaties and decisions, and the books of publicists in every tongue.

Reference is made in this to the San Juan water boundary controversy between the United States and Great Britain, where Emperor William I. gave the award in favor of the United States by deciding "that the boundary line between the territory of Her Brittanic Majesty and the United States should be drawn through the Haro Channel." This court observed that it was apparent that the decision was based upon the deep channel theory as applicable to sounds and arms of the sea, such as the straits of San Juan de Fuca.

In fixing the boundary line of the Detroit river under the treaty of Ghent, the deep water channel was adopted, giving Belle Isle to the United States as lying north of that channel.

In the Alaskan boundary case the majority of the arbitration tribunal, made up of Baron Alverstone, Lord Chief Justice of England, Mr. Secretary Root, and Senators Lodge and Turner, held that the middle of the Portland channel was the proper boundary line, and included Wales Island to the north of which the channel passed. This sustained the American contention in regard to the thalweg and island lying south of it.

THE FACTS.

Confidently believing that we have beyond a doubt demonstrated, by the decisions of this court, that the true boundary line between the parties to this action should be the center of the main navigable channel, we shall address ourselves to the facts of the case and endeavor to show where that channel is. Perhaps it might not be amiss to give a brief history of the various channels of this river for which we rely principally upon maps and documents prepared at the instance or under the direction of the federal government, as these in our opinion, constitute the best evidence obtainable. Practically all of the maps published by the government have been introduced by one side or the other. The complainant was particularly fortunate in having as a witness Mr. Edmund Jussen, an accomplished and able engineer, who has attended various universities in Austria, Saxony and Switzerland, and who made a very careful study of all the documentary evidence introduced. It is also a source of

felicitation that the State of Washington was enabled to have the testimony in its behalf of Mr. G. B. Hegardt, who probably has more personal knowledge, gained from actual observation of the conditions of the river between the points of controversy, than any other living man. A graduate of the school of technology in Sweden, he has since actively practised his profession. He was employed by the government for many years and all the surveys of the Columbia river between the years 1888 until 1905, were made by him personally or under his direction. All of the charts of the river at the points named issued by the government to aid mariners in the navigation of the river during this period, were based upon the hydrography and reports of Mr. Hegardt. (Record 80-1.)

The entrance to the Columbia river lies between a high rocky headland, Cape Disappointment, on the north and a low, sand point, Point Adams, on the south. Joining these two points is the Columbia River bar, which, measured along its crest, has had lengths of from 10 to 12 miles from point to point. (Record 49.) Point Adams is the northern extremity of the beach that extends up the coast from Tillamook Head, the headland next south of the entrance and distant 23 miles from Cape Disappoinment. Point Adams has been unstable in position and in 1881 was about six miles SSE. of Cape Disappointment. From Point Adams there has always extended in a NNW. direction a shoal, Clatsop Spit, whose length and area has varied greatly from time to time with the position of the channel or channels.

About Cape Disappointment also there have always been shoals that have likewise varied widely in extent and area. East of Cape Disappointment lies Bakers Bay, which has at times been in part occupied by the channel but which since 1885 has been of little depth throughout. Sand Island occupies a large part of the channel face of Bakers Bay, and the Chinook Spit, of the earlier survey, lies at its eastern end.

Between the north and south spits there have ordinarily been found intermediate shoals known as the Middle Sands which have been conected at different times either to Peacock Spit, when but

one channel existed (1885) or to Sand Island when there were two channels (1868).

At Point Adams the width of the river between the Fort Stevens wharf and Chinook Point is about 3 miles. Upstream from Point Adams there are much greater widths occupied by shoals and numerous channels. All existing survey records show the Point Adams section occupied by two channels, between which lies the Middle Ground, whose downstream end, as shown by the 13-foot contour is three-fourths of a mile below the Fort Stevens wharf and has not changed materially in position since 1868. Of these two channels the southerly or Fort Stevens channel, has always been, so far as is known, the ship channel leading to Astoria and the upper river. The northerly or Chinook Point channel leads into many smaller ones that become lost in the shoals above. Below Point adams the channel conditions have varied largely in the last century, although there is shown by all the surveys, a junction of the two channels or at least a passage between them (1839).

The foregoing description of the Columbia river entrance is taken from a report of the board of engineers made to the chief of engineers of the United States army under date of January 24, 1903, and is found on pages 49 and 50 of the record.

The earliest known chart of the entrance is a sketch made by Admiral Vancouver in 1792. (Sheet 2, Washnigton Exhibit C.) This chart is made on a small scale and, without much hydrographic detail, shows a single deep, straight channel running west into the ocean and having a least depth of 27 feet, which depth can be carried, according to the chart, into Bakers Bay. If other or lateral channels exist they are not shown nor is any channel shown along what is now known as Chinook Spit. (Record pp. 22, 50-1, 65.) The main ship channel, as shown by this map, was slightly north of the present channel line, probably about a quarter of a mile. (Record, p. 84.)

The northern boundary or 18-foot contour line of that channel ran due west from Chinook Point, passing approximately three-quarters of a mile south of Cape Disappointment and forming a deep pocket into Bakers Bay. The southern boundary, although it is not

marked as such, would probably be known as Clatsop Spit extends westerly parallel with the northern 18-foot contour line, but about a mile and a half south of it. This southern line is practically in the same position as the line marked on Washington Exhibit H, "1905 channel line." (Record, p. 150.) Sand Island, one of the tracts in controversy, is not shown upon this map. Record, pp. 84, 150.) The island as it existed in 1839, would practically be in the middle of the channel as shown on the Vancouver sketch. (Record, p. 150.)

The next map is that of Sir Edward Belcher (No. 3, Washington Exhibit C) published by the government in 1839. This is the first complete chart of the entrance and the survey exhibited a marked change since 1792. The two channels in the Point Adams-Chinook Point section remained practically unchanged, but each was prolonged to the sea by a separate channel. The Point Adams channel extended almost due west as a south channel pointing to the southwest on the bar crossing where the controlling depth was 19 feet. The north channel ran from Chinook Point northwest through Bakers Bay to Cape Disappointment. East of the cape it bent abruptly toward the south and thence to the southwest, in which latter direction it crossed the bar with a ruling depth of 27 feet. The north channel was wide and deep with depths not less than 36 feet from Chinook Point to the bar and maximum depths of 84 and 90 feet inside the cape. The shoals between the two channels extended continuously from the middle ground to the sea. There most prominent features were the Sand Island shoals which were located across the center of the entrance and extended in a northwesterly direction from the middle ground to within three-quarters of a mile of the cape. Across these shoals and between them and the Middle Ground was a connection between the two channels on which the depth was 25 feet. Between the sea ends of the two channels were the middle sands, extending four miles in a southwest direction almost at right angles to the Sand Island shoals with which they were connected. These Middle Sands had ruling depths over them of from 15 to 18 feet excepting at one point two miles from the sea where the depth was as much as 24 feet; and a 21-foot connection existed between

the north and south channels. The middle sands were submerged to depths of two or more fathoms and no part of the Sand Island shoals reached to high water. Clatsop Spit extended west from Point Adams, and but very little north of it. Peacock Spit extended nearly three miles in a SSW direction from Cape Disappointment to the north channel. No development of the shoalest parts of these spits was made by soundings and their relative heights are indeterminate.

This description of the entrance as it existed in 1839 is given this much in detail for the reason that excepting for the progressive changes noted hereafter, it is typical of the two channel conditions that continued for 40 years and until after 1880. (Record, pp. 51, 52, 66.)

The north channel approaches within a quarter of a mile of Cape Disappointment and passes north of Sand Island as it existed at that time. It would practically cut the island in two as it existed in 1905. The north channel was regarded as the better one at that time for the navigation of ocean-going steamers. (Record, pp. 85-6.) The Middle Sands referred to have now entirely disappeared. Sand Island appears on this map for the first time. Since then it has undergone great variations in form and position and has had its influence on the depth of channels. (Record, pp. 20, 151.)

The southern part of this shoal was in 1839 where the point of the 18-foot curve of Clatsop Spit now is. Since 1839 it has had its southern side steadily eroded by the currents of the deep channel there, and its middle has moved north a mile and a quarter until it now joins other shoals in Bakers Bay on the north side of the river. In the same period the part above water has moved northward a mile and three-quarters. (Record, p. 23.)

The next map is one of the United States exploring expedition made by Captain Charles Wilkes in 1841. The position of Clatsop Spit is very much the same as in 1839. The Middle Sands occupy about the same position, but the bar channels have formed in one, being practically the north channel of 1839. (Record 87.) As Sand Island moved north the northern channel was gradually closed so that now but 13 feet of water can be carried around its northern side. (Record

23.) There is nothing to indicate the location of Sand Island on this map in Baker's Bay, except two spits marked "Bare." (Record 88.) There is nothing to indicate upon the map which is the better channel. The south channel would be better in certain winds and the north better in the opposite winds. The south appears to be the better course directly in from sea, as it is straighter and shorter. (Record 89.)

The next map published by the government was in 1851, prepared under the direction of the United States Coast Survey from the hydrography of 1850. Two channels are shown. The south channel has broken through the spit and moved much further south. The Middle Sands have divided the channels absolutely at the entrance. (Record 89.) The entrance of the south channel is practically two miles southeast of the entrance of the junction of the two channels in 1841, and its ruling depth is greater than that of the north. Complete sailing directions are shown upon the map for both channels. (Record 90.) Sand Island is shown and this is the first government publication where it appears as such. The island is about a mile and three-quarters to two miles south of the most southerly portion of the island as it exists at the present time. (Record 91.) The south channel appears to be the more direct one at that time from the ocean to Astoria. (Record 153.) There is no evidence of the existence of a middle channel upon this map. (Record 155.)

In 1854 the United States Coast Survey published another map from the hydrography of 1852. (Oregon Exhibit No. 5.) Two distinct and separate entrances are shown to exist. The better entrance into the river is now through the south channel where after crossing a narrow bar with 21 feet of water upon it, a channel nearly one mile wide with good depths is open. (Record 68-69; 31.) The sailing directions given on the map indicate that the southerly channel is the main ship channel. (Record 155.) The depth in the north channel is less than in the last preceding map. This channel then passed through the southern portion of Sand Island as it exists at the present time. No ship channel is shown north of Sand Island as

it is now located, nor is there any evidence of the existence of a middle channel. (Record 156-7; 31.)

~~The next ensuing map was published by the Coast Survey in 1874, from the hydrography of 1868, and~~ is the map nearest in point of time to the date of admission of Oregon into the Union. The hydrography of this map is shown on the reproduction of the Washington Exhibit H (which is included in this brief), in the orange tinted portion thereof. The hydrography in black is that of 1905. The two channel lines are delineated in red, one marked, "North Channel Line, 1854," and the other marked "South Channel Line, 1854." This composite map shows the hydrography of ~~1868~~ 1854 and 1905 for the purpose of ready comparison. This reproduction of the hydography was done under the personal supervision of Messrs. Jussen and Hegardt from certified copies of the original map. (Record 83-146.) The survey of 1868 shows the south channel in its best condition. With the continued growth of Clatsop Spit it was pushed still further north with a resulting corresponding movement of Sand Island and the gradual obliteration of the Middle Sands. (Record 52.) The north channel is further north than it was on the previous survey, having been pushed northward fully one mile by the building up of the Middle Sands. Its ruling depth through Bakers Bay is about 3½ fathoms and it appears to be shoaling and narrowing up considerably. (Record 93-4.) Sand Island has moved NNW between three-fourths of a mile and a mile, and the portion above high water is very much greater in extent than it was in 1854. (Record 94.) The south channel enters in practically the same position as it did in the preceding map, but it is practically twice as wide and has a least depth of 4¾ fathoms. Vessels passing up this channel go south of Sand Island. (Record 94.) The south channel is the straighter, wider and better one. (Record 24-31-95.) In the section between Tansy Point on the south and Point Ellice on the north, there is a middle channel immediately north of the shoals, which, although not designated on this map as Desdemona Sands, are probably identical with what is now known as Desdemona Sands. The ruling depth of that channel at its point of entrance is 3¾ fathoms. It extends easterly to the

limits of the map, but immediately north of a point designated thereon as Smith Point, it shows a contraction and some shoaling. The hydrography does not show that this middle channel could be or was used as a ship channel except for light draught vessels, nor are there any sailing directions, beacons, buoys, spars, or otherwise, to indicate that it was used as a ship channel. (Record 101, 158-159.) In fact, it never was a navigable ship channel, never was used as such, and is not now. (Record 103.) So far as is shown by any maps or records in evidence, this channel made its first appearance in the survey of 1868. (Record 113.) The map does not show that it was provided with the usual aids to navigation and it is not of sufficient depth to admit of the passage of ocean going vessels over the portion shown on Washington's Exhibit H. (Record 160.) The continuation of this channel beyond the most easterly portion thereof, as shown on Exhibit H, and which appears on Exhibit I, demonstrates that the channel dies out in shoals, and on the portion shown on Exhibit I, there are no buoys or other aids to navigation. (Record 161.) It is not possible to use this channel for the passage of steamers up the river. On the contrary, a deep seagoing vessel could get up through the channel only as far as Knappton, and if it desired to proceed to Portland, it would be necessary to retrance its course as far as the western end of what is now known as Desdemona Sands where it would find entrance into the south or main channel of the river, which is marked on Exhibit H in black "1905 Channel Line." (Record 162.)

It is upon this 1854 map that the initial point of the boundary line is fixed for the purposes of this action, but unfortunately disagreement exists as to the location of such point. The act of Congress fixes the initial point as one marine league due west of and opposite the middle of the mouth of the North Ship channel, and the inability of the engineers of the parties to arrive at an identical point, arises from a dispute as to what is in reality the mouth of the North Ship channel. The witnesses for the complainant fix the middle of the mouth of this channel at the intersection of a dotted range line from Point Adams to Coxcomb Hill with the red lines, marked respectively "one marine league due west" and "North Ship Channel Line 1854," shown on the

map attached to this complaint. The initial point is then placed one marine league west of the point of intersection. An inspection of the map will show that this point at the intersection of the red lines is where the current of the north channel empties into the ocean. It will be observed that there are spits north and south of this point and that the channel there is comparatively narrow. Messrs. Jussen and Hegardt, our witnesses, fixed the initial point of the boundary, as contended for by complainant, after a very careful study of the surveys and maps published by the government in 1868, which surveys are the nearest in point of time to the admission of Oregon into the Union. Mr. Hegardt in determining this point "took as the mouth of the North Ship channel that point that vessels going out to sea would pass directly into the ocean, that is, where they get clear water or clearance entirely." (Record 112.) Mr. Hegardt considered the mouth of the channel to be that point where it entirely disappears in the billows of the ocean. (Record 113.) That is, where it passed into the ocean beyond all controlling influences of shoals and sands. (Record 114.) A very good definition was given by him in these words:

> If there was not a channel used, there would not be any use in defining it, if it was all deep water. A channel is bounded by shores or spits, and if there were no spits or shoals of any kind out there it would not be necessary to define it as a channel. It would be the ocean. (Record 115.)

Mr. Jussen is in entire accord with Mr. Hegardt as to the location of this initial point. In determining this point the sailing directions given upon the map, together with the range lines for both the north and south channels, were used. Mr. Jussen's definition of the mouth of the channel is as follows:

> The mouth of a channel, or the mouth of a river, rather, I would consider to be that point where the stream leaves the confining influences of both headlands and spits. (Record 149.)

Captain Rockwell, for a great many years employed by the government in the coast and geodetic survey upon this portion of the river, agrees with Messrs. Hegardt and Jussen as to what is the mouth of

the North Ship channel, and the initial point as determined by him coincides with the one for which we herein contend. (Record 208.)

While it is our contention that the boundary between the states is the varying center of the main navigable ship channel, yet it may be assumed that the initial point being one marine league at sea, remains fixed, and therefore we have proceeded upon this hypothesis, and the 1905 channel as delineated upon the map in this brief, commences at that point.

As already stated this initial point, as claimed by the complainant, was determined from the surveys nearest in point of time to the admission of the State of Oregon. An entirely different rule was followed by the engineer for the defendant. He disagrees with our engineers as to what the mouth of the channel is, claiming that a line drawn from the headlands on either side of the river, defines the mouth, notwithstanding the fact that there may be shoals or even islands seaward from such connecting line. In determining the mouth of the north ship channel, Mr. Lewis, representing Oregon, took the hydrography or surveys of 1868 and then attempted to follow what now remains of those channels. He did not attempt, in drawing his boundary line, to follow ship channels as they existed in 1868, but on the contrary, pursued the course now shown by what remains of those channels, notwithstanding the fact that they have greatly shifted. Mr. Lewis admitted that a ship channel never passed as far north as the blue line shown on Exhibit H now shows. (Record 377.) He pursued the same rule in tracing his boundary line throughout Exhibits H and I (Record 382) although, as stated by him, it would not now be and never was possible for an oceangoing vessel to come into the Columbia River and proceed up the same upon the course shown by the line he has made, and which is claimed by Oregon as the true boundary. (Record 383.) In fact, all witnesses who were interrogated upon the question, professional and lay, stated that at no time in the history of the river was it possible nor is it now, for an oceangoing steamer to proceed upon the course shown by such line. (Record 132; 136; 137; 138; 139; 140; 193; 209.)

An instructive tabulation, taken from a report of a board of engineers, U. S. Army, dated October 13, 1882, showing the location and depths of different surveys for the years enumerated, is found in the Record on pages 31 and 32.

We quote the following from report of a board of engineers, U. S. Army, dated January 24, 1903, and found at page 53 of Record:

The above channel history may be summarized in a few words: Clatsop Spit subsequent to 1839 steadily increased in length, area and elevation, reaching its maximum elevation probably about the time of the 1868 survey, but continuing to lengthen to the end of this period, 1881. The south channel, assumed to be the development of a swash channel across an earlier Clatsop Spit, moved north with the growth of Clatsop Spit while its outer end remained in about the same position as in 1839, the bar crossing always pointing to the south of west. It increased in depth to 27 feet in 1868 and then deteriorated again to 19 feet in 1881, with the changes in Clatsop Spit and the Middle Sands. The island shoals, assumed to be the detached remnant of an earlier Clatsop Spit, moved steadily north and increased in elevation but decreased in area. The Middle Sands, trailing seaward from the Sand Island shoals, increased in area to 1851 and in elevation to 1858 and decreased in each subsequent to those dates. The north channel, which in 1839 was wide and deep through Bakers Bay and carried 27 feet across *across* the bar, steadily deteriorated throughout after 1852, shoaling to 19 feet at both ends. It retained its southwest direction across the bar until the later seventies, and then swung around to the northwest. Peacock Spit retained its position practically unchanged during the entire period, but in 1881 it had but two-fifths of its maximum length of 1851.

After 1881 the north channel continued to deteriorate and by 1885 it had practically disappeared. Since that time there has been but one channel, the old south channel, which retained without material change its location and depth across the southwest section of the bar until 1889. Clatsop Spit continued to grow to the north and west until even a later date, but lost in elevation until reinforced by the construction of the jetty. Its most marked development was the appearance in or before 1881 of a new swash channel near Point Adams, which continued to grow in width and depth until after 1885 and promised, if not checked, to develop into a new south channel similar to that of 1839. Sand Island and the channel north of Clatsop Spit were pushed further north, and this movement continued until the sand movement on Clatsop Spit was controlled by the construction of the jetty designed by the Board of 1882. The Middle Sands as an appendage to Sand Island disappeared, but remained as the outer crest of the bar and a barrier directly across the entrance. Peacock Spit to 1889 gradually shortened in a north and

south direction, but grew extensively to the southwest along the crest of the bar. Bakers Bay became an area of shoals and has so continued to the present time.

A history of the continuing changes in the channels of the river between the surveys of 1868 and the commencement of this action, will be found on pages 69 to 79 of the record. We feel that it is hardly necessary to recite the facts again in this brief; and content ourselves with saying that the line marked "1905 channel line" on the attached maps correctly fixes the middle of the channel best suited and ordinarily used for the purposes of navigation at the time of the commencement of this action.

This line was placed thereon under the direction of engineers Hegardt and Jussen and is based upon the latest publications in 1905 of federal government. It conclusively appears, by the testimony of all the witnesses, that this line correctly shows the main ship channel, as now used. An inspection of the map will show that the line passes between the usual buoys and spars placed in the river by the government. (Record 146, 160-1-2, 112, 81-2; 183.)

Captain Rockwell also verifies the accuracy of the hydrography transposed to this Exhibit and states that the "North Channel Line 1854" and the "South Channel Line 1854" are correctly reproduced upon the map, (Record 208), and further states that never within his knowledge has it been possible for an oceangoing vessel to pursue a course upon the river, which would be identical with the blue line on Exhibits H and I, the boundary line claimed by the State of Oregon; nor did he ever know of vessels going up the river and passing north of Desdemona Sands except where their destination was only to Knappton. (Record 208-9.)

The discussions thus far have been limited to that portion of the river shown on Washington's Exhibit H, and we shall now take up the other point in controversy which is shown upon Exhibit I, the reproduction of which is contained in this brief. An inspection of this map will show that the blue line thereon is what is claimed as the boundary by the State of Oregon. The black line is the 1905 channel line and the one now generally used in the navigation of the river.

Washington contends that the red line marked "1859 channel line" should be the boundary between the states in this section of the river because, as we shall endeavor to show, it was at the date of the admission of Oregon into the Union, the main navigable channel of the river and would have continued as such and would now be such were it not for the diversion of the channel therefrom by artificial means placed in the river by or under the sanction of the federal government.

It may appear to be inconsistent upon the part of the State of Washington to claim that the 1905 channel line on Exhibit H should be taken as the true boundary line and to contend that a different line on Exhibit I should perform the same function. It has been announced by this court that when Congress has once defined the limits of a state it is powerless to effect a change thereof. Congress therefore, not having the power to change the limits of a state directly, cannot do so indirectly. It is our contention that by the act of the government, in diverting by artificial means the natural course of the main channel in the river, cannot affect the boundary line of Oregon but that it must remain as originally described, the natural main ship channel of the river.

Exhibit I was prepared under the direction of the engineers of the State of Washington and the information placed thereon in coloring was taken from official maps published by the government and is correct in all particulars. (Record, pp. 88, 194, 199-200.) It appears from the evidence that up to 1867 and 1868 the main ship channel of the river was what is marked thereon as "1859 channel line" and it ran through what is known as the Woody Island channel. (Record, p. 106.) About 1867 Cordell discovered a northerly channel which is marked on Exhibit I as "1875." This channel was abandoned in 1882 because of shoaling. The government built a jetty across the eastern mouth of the Cordell Channel, which had the effect of closing it up entirely. (Record, p. 177.) It also had the effect of closing up the Woody Island Channel and diverting the water along the shore of the Washington side of the river, thereby making a new channel between Jim Crow Point and Yellow Bluffs. (Record, pp. 107-8.) The natural tendency of the flow of the cur-